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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,250	07/01/2003	Donald J. Curry	117289	3355

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P.O. BOX 19928
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EXAMINER

HUNG, YUBIN

ART UNIT	PAPER NUMBER
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2624

DATE MAILED: 11/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/612,250

Applicant(s)

CURRY ET AL.

Examiner

Yubin Hung

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>12/10/03, 5/12/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:
 - P. 15: "Gr" in lines 9 and 12 should have been "Grr"; "Grass" in line 11 should have been "Grs"; "Ms", "Gr." and "Gr." in line 15 should have been "MSB", "Grr" and "Grr", respectively; and "[Sm]" in line 21 should have been "[sz]"
 - P. 17, last paragraph, line 3: "155" should have been "150"
 - P. 18, 3rd paragraph, last two lines: it is not clear how the 16 possible edge locations are indicated
 - P. 23, 2nd paragraph, line 1: "PDL MRC Segmentation Module 25" should have been "PDL Segmentation Module 26"
 - P. 23, 4th paragraph through P. 25, 2nd paragraph: it is not clear what the values of Grr (as output from PDL Segmentation Module) are: are they the classes (10 different values), the associated values (i.e., Bgr, Fgr or weak Fgr) as per Fig. 14; or other un-disclosed values?
 - Claim 2, line 4: "signaled" should have been "signal." Do the same for claim 14
 - Claim 3, line 3: "wherein" should have been "then." Do the same for claim 15

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 1, and similarly claim 13, recites the limitation "multi-bit monochrome signal which codes both weak, strong and direction of a selector signal" in lines 3 and 4. In the specification weak and strong are used to refer to a specific range of values (e.g., a value of -1 or 1 is considered to indicate a weak edge and a value < -1 or > 1 is considered to indicate a strong edge; see P. 15, lines 14-18); it is not clear whether it is the two *values* "strong" and "weak" that are coded in the multi-bit signal or the range of values of Grr -128 (see P. 15, lines 14-18). The meaning of "direction" as part of a selector signal has not been disclosed in the specification at all. Therefore, the metes and bounds of the claim cannot be determined. Dependent claims 2-12 and 14-22 are similarly rejected.

5. Claims 15-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 15 recites the limitation "the signed number" in line 3. There is insufficient antecedent basis for this limitation in the claim. Claims 16 and 17 are similarly rejected.

[Note: Per corresponding method claims 3-5, for examination purpose claims 15-17 are interpreted as being dependent from claim 14, instead of from claim 13.]

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US 5,694,487), and further in view of Tan et al. (US 6,707,952).

Regarding claim 1, Lee discloses

- inputting a multi-bit monochrome signal which codes both weak, strong and direction of a selector signal
[Fig. 1, refs. 200 (generating edge image), 500 (inputting/storing edge image); Col. 4, lines 14-38, especially Eq. 3. Note that an edge value of 0 is considered as weak and also indicating one direction; on the other hand, an edge value greater than 0 is considered as strong and indicating another direction]
- partitioning the selector signal into a plurality of uniform blocks
[Abstract: lines 8-9; Fig. 1, ref. 600 & 700 (partitioning); Col. 4, line 59-Col. 5, line 3 and Col. 5, lines 8-19; Col. 7, lines 16-22]

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Li does not expressly disclose performing two-dimensional filtering over each block and replacing the original weak selector signal with the filtered results.

However, Tan discloses 2-dimensionally filtering an image block [Fig. 1, refs. 150 & 160; Co. 2, lines 61-65 (being able to select a main direction implies 2-D)] and replace values of selected pixels with the corresponding filtered values [Fig. 1, ref. 170; the selected pixels are those that are not identified in Fig. 1, refs. 130 & 140 and are considered "weak" since they are not edge points].

Lee and Tan are combinable because they both have aspects that are from the same field of edge detection.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Lee with the teachings of Tan as recited above. The motivation would have been to improve image quality by removing ringing artifacts, as Tan indicates in column 1, lines 30-44.

Therefore, it would have been obvious to combine Tan with Lee to obtain the invention as specified in claim 1.

9. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US 5,694,487) and Tan et al. (US 6,707,952) as applied to claim 1 above, and further in view of Yuan (US 5,367,385).

Regarding claim 2, the combined invention of Lee and Tan discloses all limitations of its parent, claim 1.

The combined invention of Lee and Tan does not expressly disclose subtracting a bias from the monochrome multi-bit signal to result in a signed number. However, Yuan discloses subtracting a bias from gradients. [Fig. 10, ref. 216; Col. 2, lines 39-51; Col. 10, lines 32-35. Note that since the size of the bias, which is the average difference, is not known in advance, it would have been obvious to one of ordinary skill in the art to use signed number to represent the biased gradient value.]

The combined invention of Lee and Tan is combinable with Yuan because they both have aspects that are from the same field of edge detection.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Lee and Tan with the teachings of Yuan as recited above. The motivation would have been to improve the image quality by smoothing it in the appropriate direction so as not to remove or distort edges, as Yuan indicates in column 1, lines 35-40 and column 2, lines 48-51.

Therefore, it would have been obvious to combine Yuan with Lee and Tan to obtain the invention as specified in claim 2.

Allowable Subject Matter

10. Note: Regarding claim 8, and similarly claim 19, "+/-K" of line 5 is interpreted as per page 16, line 3 of the specification.

11. Claims 3-12 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

12. Claims 13-22 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

13. The following is a statement of reasons for the indication of allowable subject matter:

13.1 Regarding claims 3-6, closest art of record Lee, Tan and Yuan, alone or in combination, do not disclose, teach or suggest defining a weak or strong selector signal in the recited manners.

13.2 Regarding claim 7, closest art of record Lee, Tan and Yuan, alone or in combination, do not disclose, teach or suggest performing a 4-pass 2-D filtering process in the recited manner.

13.3 Regarding claim 13, closest art of record Lee, Tan and Yuan, alone or in combination, do not disclose, teach or suggest the specific means for performing two dimensional filtering over each block as recited in the specification (Fig. 3, ref. 56 and P. 15, 4th paragraph-P. 16, 3rd paragraph).

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Matthews (US 6,633,670) – discloses using gradients of a partitioned image to calculate the mask for multi-layer image decomposition
- Varga (US 6,654,471) – discloses replacing the values selected input data with filtered values
- Lee et al. (US 5,883,983) – discloses dividing a gradient image as part of blocking effect reduction
- Diep et al. (US 5,475,768) – discloses replacing values of selected pixels with baseline values

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (571) 272-7451. The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

Yubin Hung
Patent Examiner
Art Unit 2624
November 3, 2006